

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (Original) An imaging system configured to compensate for one or more
2 individual defective pixels in an array of pixel elements, the system
3 comprising:
4 an array of pixel sensor elements;
5 a readout controller coupled to the array, the readout controller configured
6 to read a block of pixels within the array, the block including a center
7 pixel, the controller further configured to generate pixel addresses of at
8 least three subsets of pixels within the block; and
9 a bad pixel detection and correction unit configured to determine a subset
10 with a minimum variance, calculate a median of each subset,
11 determine whether a value of the center pixel exceeds the medians of
12 the subsets, and to replace the value of the center pixel with the
13 median of the subset with the minimum variance if the value of the
14 center pixel exceeds the medians of the subsets.
- 1 2. (Original) The imaging system as defined in Claim 1, wherein the array
2 comprises a monochrome array.
- 1 3. (Original) The imaging system as defined in Claim 1, wherein the system
2 further comprises a color filter deposited on the array.

1 4. (Original) The imaging system as defined in Claim 1, wherein the subsets
2 comprise a horizontal row and two diagonal patterns.

1 5. (Original) The imaging system as defined in Claim 1, wherein the subsets
2 comprise a vertical row and two diagonal patterns.

1 6. (Original) A method of correcting one or more individual defective pixels in
2 an array of pixel elements, the method comprising:

3 reading a pixel block of an array of pixel sensor elements, the pixel block
4 including an interior pixel;

5 selecting at least a first subset, a second subset and a third subset of
6 pixels within the pixel block, the first subset comprising pixels arranged
7 in a first diagonal pattern within the block, the second subset arranged
8 in a second diagonal pattern within the block, the third subset arranged
9 in a non-diagonal pattern;

10 calculating a variance between a highest and a lowest pixel sensor value
11 within each subset;

12 identifying a subset with the least variance;

13 calculating a first value based on at least one of a median, average, and
14 mean pixel sensor value for the corresponding three subsets;

15 determining whether a value for the interior pixel varies from the first value
16 by more than a first amount; and

17 replacing the value for the interior pixel with a replacement value based on
18 the pixel sensor values of the subset with the lowest variance if the

19 value for the interior pixel varies from the first value by more than a first
20 amount.

1 7. (Original) The method of Claim 6, further comprising:
2 selecting a fourth subset arranged in another non-diagonal pattern; and
3 calculating a variance between a highest and a lowest pixel sensor value
4 within the fourth subset.

1 8. (Original) The method of Claim 6, wherein the non-diagonal pattern is
2 horizontal.

1 9. (Original) The method of Claim 6, wherein the non-diagonal pattern is
2 vertical.

1 10. (Original) The method of Claim 6, wherein the act of reading a pixel block
2 comprises reading a 3 x 3 pixel block.

1 11. (Original) The method of Claim 6, wherein the act of reading a pixel block
2 comprises reading a 5 x 5 pixel block.

1 12. (Amended) A method of detecting and compensating a defective pixel
2 element within an array of pixel elements in an imaging device while the
3 imaging device is in use by an end-user, the method comprising:
4 capturing an image taken by the end-user using the imaging device;
5 for the captured image,

6 selecting a first pixel element for determination that said pixel
7 element is defective,

8 identifying an associated set of pixel elements of said array of pixel
9 elements in which said first pixel element is member,

partitioning said associated set of pixel elements of said array into a
plurality of subsets of the associated set such that said first pixel
element is centrally included,

determining an arithmetic central value for each of the plurality of
subsets of the associated set;

~~comparing a first pixel element value of said first pixel element with a~~
~~second value related to said arithmetic central value for each of the~~
~~plurality of subsets of the associated set at least element values of~~
~~other imaging pixel elements in a first group;~~

determining from the comparison if the value of the first pixel element is in
error; and

substituting a third value related to the value of at least one of the other
pixels elements at least partly in response to determining the first pixel
element value of the first pixel element is in error.

13. (Amended) The method as defined in Claim 12, wherein the comparison
act includes comparing the value of the first pixel element with the median
value of each of the plurality of subsets of the associated set ~~the first~~
~~group of pixels.~~

14. (Amended) The method as defined in Claim 12, wherein the plurality of
subsets of the associated set ~~first group~~ include at least two pixel
elements adjacent to the first pixel element.

15. (Amended) The method as defined in Claim 12, wherein the second value
is also related to the ~~first pixel element value~~ of the first pixel element.

1 16. (Amended) The method as defined in Claim 12, wherein the third value is
2 related to the median value of at least two other pixel values.

1 17. (Amended) The method as defined in Claim 12, wherein the imaging
2 device is a color imaging device, and the pixel elements of the plurality of
3 subsets of the associated set ~~other pixels~~ whose values are compared to
4 the first pixel value are intended to sense the same color as the first pixel
5 element.

1 18. (Original) The method as defined in Claim 12, wherein the imaging device
2 is a monochrome imaging device.

1 19. (Amended) An imaging system configured to compensate for one or more
2 individual defective pixels in an imaging array, the system comprising:
3 a readout controller coupled to the imaging array, the readout controller
4 configured to read a group of pixels within the array;
5 a defective pixel detection circuit configured ~~to determine when at least a~~
6 ~~first pixel value associated with a first pixel within the group of pixels~~
7 ~~varies from a second value related to at least one other pixel within the~~
8 ~~group of pixels by a first amount~~
9 to select a first pixel element for determination that said pixel
10 element is defective,
11 to identify an associated set of pixel elements of said array of pixel
12 elements in which said first pixel element is member,

13 to partition said associated set of pixel elements of said array into a
14 plurality of subsets of the associated set such that said first pixel
15 element is centrally included,

16 to determine an arithmetic central value for each of the plurality of
17 subsets of the associated set,

18 to compare a value of said first pixel element with a second value
19 related to said arithmetic central value for each of the plurality of
20 subsets of the associated set at least element values of other
21 imaging pixel elements in a first group, and

22 to determine from the comparison if the value of the first pixel
23 element is in error; and

24 a pixel compensation circuit configured to replace the value of the first
25 pixel with a third value related to at least one other pixel within the
26 group of pixels when the first pixel value varies by more than the first
27 amount from the second value.

1 20. (Amended) The imaging system as defined in Claim 19, wherein the
2 second value is a median value of each of the plurality of subsets of the
3 associated set ~~a plurality pixel values of pixels within the group of pixels.~~

1 21. (Amended) The imaging system as defined in Claim 19, wherein the
2 second value is an average value of each of the plurality of subsets of the
3 associated set ~~a plurality pixel values of pixels within the group of pixels.~~

1 22. (Amended) The imaging system as defined in Claim 19, wherein the third
2 value is related to the median value of each of the plurality of subsets of

3 ~~the associated set a plurality pixel values of pixels within the group of~~
4 ~~pixels.~~

1 23. (Original) The imaging system as defined in Claim 19, further comprising a
2 color filter overlaying at least a portion of the array.

1 24. (Original) The imaging system as defined in Claim 19, wherein the array is
2 a CMOS array.

1 25. (Original) The imaging system as defined in Claim 19, wherein the array is
2 a CCD array.

1 26. (Amended) A camera system, comprising:
2 an imager, including a plurality of pixels;
3 a lens overlaying at least a portion of the imager;
4 a readout circuit coupled to the imager, the readout circuit configured to
5 read imager pixel values;
6 a defective pixel detection circuit configured ~~to determine if a first pixel is~~
7 ~~defective by examining the pixel values of a plurality of pixels readout~~
8 ~~by the readout circuit;~~
9 to select a first pixel element for determination that said pixel
10 element is defective,
11 to identify an associated set of pixel elements of said array of pixel
12 elements in which said first pixel element is member,
13 to partition said associated set of pixel elements of said array into a
14 plurality of subsets of the associated set such that said first pixel
15 element is centrally included,

16 to determine an arithmetic central value for each of the plurality of
17 subsets of the associated set,
18 to compare a value of said first pixel element with a second value
19 related to said arithmetic central value for each of the plurality of
20 subsets of the associated set at least element values of other
21 imaging pixel elements in a first group, and
22 to determine from the comparison if the value of the first pixel
23 element is in error; and

24 a pixel compensation circuit configured to substitute the value of the first
25 pixel with a value related to at least one other pixel value readout by
26 the readout circuit; and
27 a power supply used to power the readout controller, the defective pixel
28 detection circuit, and the pixel compensation circuit.

1 27. (Original) The camera system as defined in Claim 26, wherein the camera
2 system is a video camera.

1 28. (Original) The camera system as defined in Claim 26, further comprising
2 an NTSC encoder coupled to the readout circuit.

1 29. (Original) The camera system as defined in Claim 26, wherein the camera
2 system is located on a phone.

1 30. (Original) The camera system as defined in Claim 26, further comprising a
2 color filter positioned over at least a portion of the imager.

1 31. (Amended) A method of detecting a defective pixel element within pixel
2 elements in an imaging device using an image captured by the end-user,
3 the method comprising:
4 for the captured image, comparing a ~~first pixel element value~~ of a first pixel
5 element with a second value related to an arithmetic central value at
6 least determined from element values of pixel elements in a two
7 dimensional neighborhood associated with said first pixel element;
8 determining from the comparison if the first pixel element value is in error;
9 and
10 substituting the first pixel element value with a third value related to a
11 value of at least one of the other pixels elements in the two
12 dimensional neighborhood.

1 32. (Original) The method as defined in Claim 31, wherein the second value is
2 related to at least two element values corresponding to at least two pixels
3 on opposite sides of the first pixel element.

1 33. (Original) The method as defined in Claim 31, wherein the comparison
2 includes determining if the first pixel element value varies from the second
3 value by more than a threshold amount.

1 34. (Amended) An imaging system comprising:
2 an imager including a plurality of pixel sensor elements;
3 a controller coupled to the imager, the controller configured to read pixel
4 sensor element values;

5 a defective pixel detection circuit configured to determine when at least a
6 ~~first pixel value~~ of a first pixel associated with a first pixel sensor
7 element within a two dimensional neighborhood associated with said
8 first pixel is in error by comparing the ~~at least first pixel value~~ of the first
9 pixel to a second value related to an arithmetic central value
10 determined from at least one other pixel element within the two
11 dimensional neighborhood; and
12 a pixel compensation circuit configured to replace the value of the first
13 pixel element with a third value related to at least one other pixel
14 element within the two dimensional neighborhood.

1 35. (Added) The method as defined in Claim 12, wherein the arithmetic central
2 value for each of the plurality of subsets of the associated set is the
3 median, average, or mean of for each of the plurality of subsets of the
4 associated set.

1 36. (Added) The imaging system as defined in Claim 19, wherein the
2 arithmetic central value for each of the plurality of subsets of the
3 associated set is the median, average, or mean of for each of the plurality
4 of subsets of the associated set.

1 37. (Added) The camera system as defined in Claim 26, wherein the
2 arithmetic central value for each of the plurality of subsets of the
3 associated set is the median, average, or mean of for each of the plurality
4 of subsets of the associated set.

- 1 38. (Added) The method as defined in Claim 31, wherein the arithmetic central
2 value for each of the plurality of subsets of the associated set is the
3 median, average, or mean of for each of the plurality of subsets of the
4 associated set.
- 1 39. (Added) The imaging system as defined in Claim 34, wherein the
2 arithmetic central value for each of the plurality of subsets of the
3 associated set is the median, average, or mean of for each of the plurality
4 of subsets of the associated set.